SECTION 14

PART C

ALTERNATOR

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14C . 1 SPECIFICATION:

Voltage	12 volt negative ground
Alternator - 2600 series tractors	
Make	LUCAS - TVS
Type.....	A115
Max output	36 Amps
Regulator	Machine sensed
Regulating voltage	14.4 ± 0.2 volts
Location.....	MF2605 - Left-hand side MF2615 - Right-hand side

Bolt Torques

Alternator pulley nut	29.5 to 34.5 lbs.ft. (40 to 47 Nm)

14C . 2 GENERAL DESCRIPTION:

The alternator is mounted on the right hand side(for MF2615) and left-hand side (For MF2605) of the engine and is driven by a V-belt from the crankshaft pulley. Adjustment of the V-belt tension is provided for with a slotted link and clamp bolts.

ALTERNATOR

Introduction

The alternator produces alternating current which is converted to direct current before being connected to the tractor electrical system. The alternator is provided to supply a source of electrical power used to charge the battery after starting and to operate all the tractors electrical services while the tractor is running.

Routine maintenance

Routine maintenance is limited to wiping away any oil or dirt from around the openings on the alternator and cleaning any dust or chaff that has accumulated internally with a soft brush or air line.

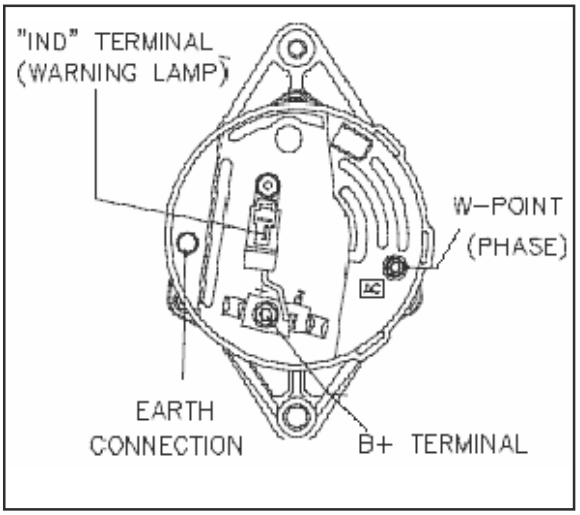

Fig 1

Precautions in service

Various precautions should be taken to avoid damage to the semi-conductor components within the alternator.

1. Do not connect or disconnect any part of the charging circuit, including the battery, while the engine is running.
2. When using a slave battery, or battery charger always observe correct polarity (positive to positive,negative to negative).

14C . 3 Alternator testing (Fig. 1)

The following test will check for normal operation of the alternator by taking voltage and ampere readings at selected points in the circuit. Refer fig 1 on 14 C - 3 .The 'IND' terminal (LUCAS),is the indicator connection from the charging warning light on the instrument panel . Terminal 'B' positive is the connection to the battery and 'W' is the square wave signal to instrument cluster hour counter/RPM meter

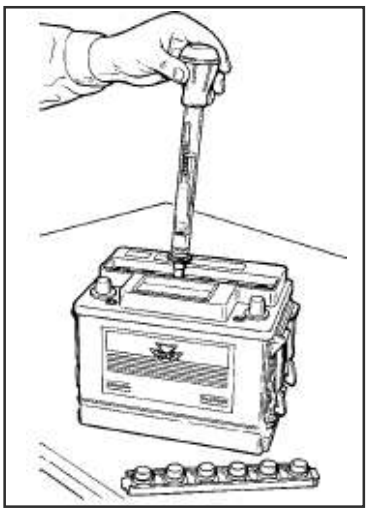

Fig 2

TEST 1 - Battery test (Fig. 2)

Using the hydrometer, check that the battery is at least 70% charged and in good condition.(See fig 2)

Diagnosis:

S.NO	RESULT	ACTION
1	Reading below 1.230	Recharge battery or replace and retest
2	Reading below 1.230 - 1.290	Proceed to test 2&3

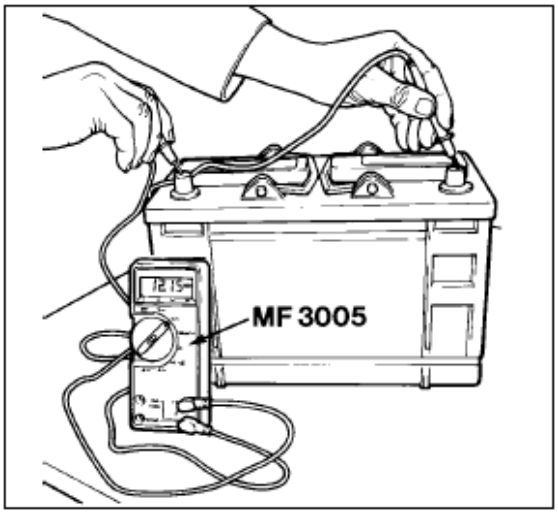

Fig 3

Alternative test (Fig. 3)

Measure the open circuit voltage of the battery with the MF.3005 Digital Multimeter to establish the state of the charge.

Diagnosis:

S.NO	RESULT	ACTION
1	12 volts	Discharged battery - recharge
2	12.4 volts	50% charge - recharge
3	12.7 volts	Fully charged

TEST 2 - Drive belt tension (Fig. 4 & 5)

1. Allow 0.393 inch (10 mm) deflection in MF2615 and 0.314 inch (8mm) in MF2605,when moderate finger pressure is applied to the longest run at the belt, see 'A' Fig. 4 & 5.
2. The alternator will not charge the battery if the belt is too slack. On the other hand, an excessively tight belt may damage the bearings. If the belt is worn or oily, it must be replaced with a new Massey Ferguson belt.

Diagnosis

Result	Action
Belt slack	Adjust
Belt worn	Replace and adjust
Belt statisfactory	Proceed to test 3

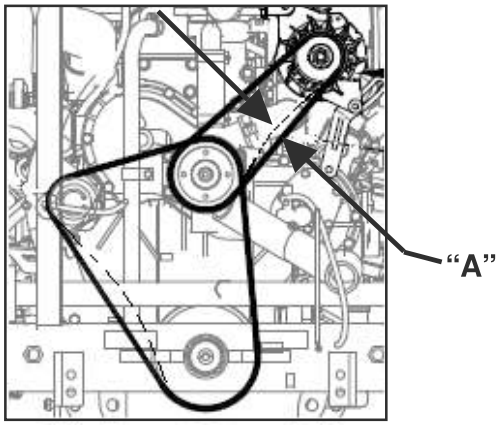

Fig 4 for MF2605

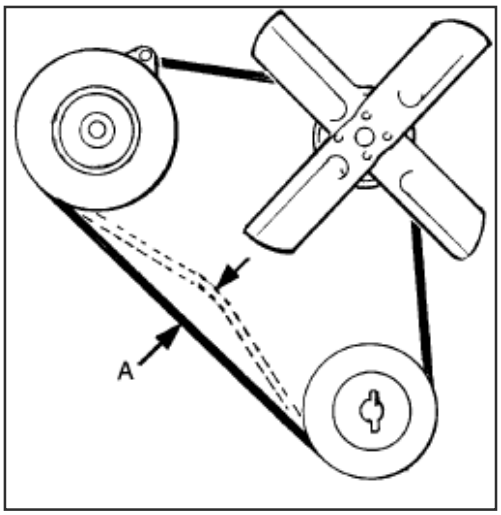

Fig 5 for MF2615

TEST 3 - Wiring connections and continuity (Fig. 6)

1. Ensure that all wires are in position and that connections are clean and tight.
2. Remove the eyelets & lucars from the alternator and connect the negative lead of the voltmeter to the battery ground, then connect the other lead to each terminal in the plug in turn A & B.
3. When testing the lucar terminal (IND test A) the starter switch must be ON (NOT engine cranking). The voltmeter should read battery voltage, if a zero reading is obtained on the lucar terminal (IND) check for faulty bulb in the alternator charging indicator light in the instrument panel.

Diagnosis:

S.NO	RESULT	ACTION
1	Reading below battery voltage	Check all wirings and connections
2	Reading of battery voltage	Proceed to test 4

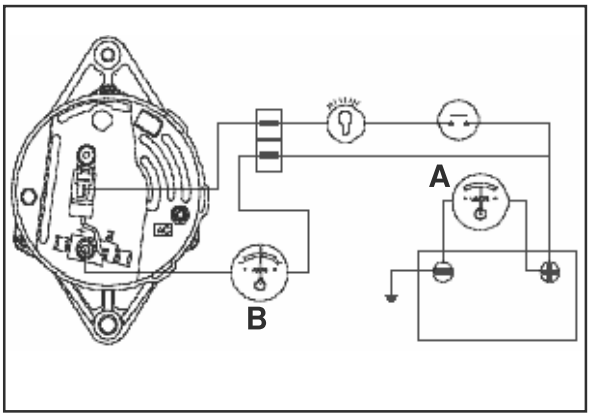

Fig 6

TEST 4 - Checking alternator maximum output (Fig. 7)

The alternator should run for a few minutes to ensure that the tests are carried out at the normal operating temperature. Then stop the engine.

1. Switch on all lights to create a load, and discharge the battery for 1 minute.
2. Disconnect the battery ground cable.
3. Disconnect the wires on the back of the alternator.
4. Connect a test link (jump lead) between the small terminal (IND) on the alternator and the IND connection wire on the harness
5. Connect the ammeter between B positive terminal on alternator and the mating wire on harness

NOTE: *The clips or test probes on the ammeter MUST NOT touch the alternator casing before or during the test. A short circuit will result which will damage the alternator.*

6. Re-connect the battery ground cable.
7. Switch on, check that the warning light comes on.
8. Start the engine and slowly increase to maximum rated speed, the ammeter reading should equal the maximum rated output of the alternator of 30 to 35 Amps.

NOTE: *As the state of charge of the battery increases so the output of the alternator will decrease. The rated output of the alternator should be checked quickly.*

Diagnosis:

Result	Action
Ammeter reading low	Replace or repair alternator
Ammeter reading 40 - 45 Volts	Proceed to test 5

TEST 5 - Checking voltage drop in charging circuit (Fig. 8)

Use a voltmeter to check for high resistance (poor connections) in the charging circuit, see Fig. 8.

1. Connect a voltmeter between the battery insulated (+) terminal and the alternator main output terminal.
2. Switch on all lights to create a load. Start the engine and increase to maximum rated speed. The voltmeter reading should not exceed 0.5 volts.

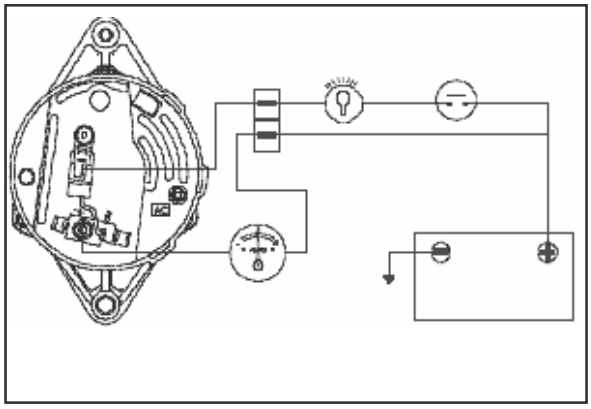

Fig 7

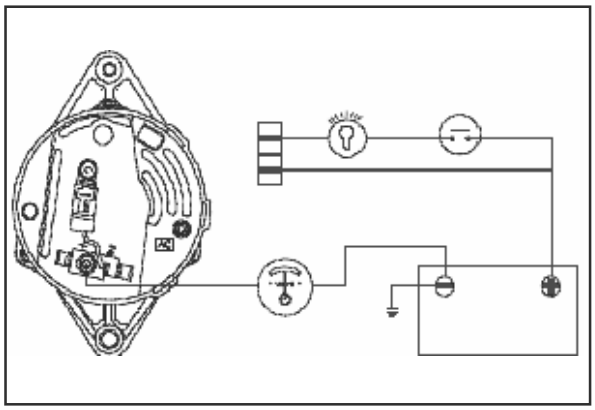

Fig 8

3. Transfer the voltmeter connections to the battery ground (-) terminal and the alternator body.
4. Start and run the engine as in (2).The voltmeter reading should not exceed 0.25 volts.

S.NO	RESULT	ACTION
1	2.Reading above 0.5 volts	Check all wirings for loose connections
2	4.Reading above 0.35 volts	
3	Reading below 0.5 volts	Proceed to test 6

TEST 6 -

Checking voltage regulator setting (Fig. 9) Before checking the voltage regulator setting, it is essential that a battery in a well charged condition is fitted to the tractor.

1. Disconnect the battery ground (-) cable.
2. Connect an ammeter between the starter solenoid terminal and the alternator main output cable.
3. Connect a voltmeter across the battery terminals. See Fig. 9.
4. Reconnect the battery ground cable.
5. Start the engine and increase the speed until the ammeter reading is less than 10 amperes. The voltmeter should be within the limits of 13.6 to 14.4 volts.

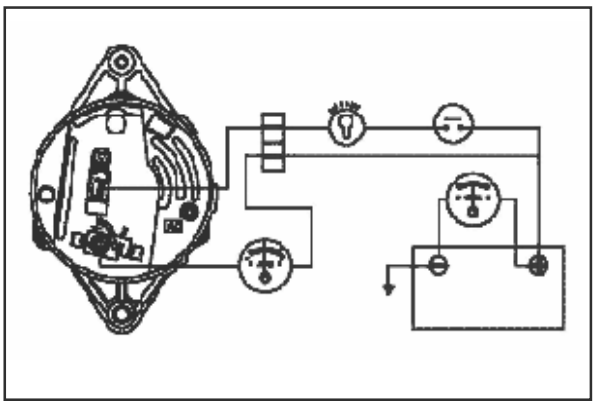

Fig 9

Diagonsis:

S.NO	RESULT	ACTION
1	Reading is unstable or outside specified limits	Voltage regulator faulty - Replace
2	Reading 13.6 - 14.4 volts	Regulator statisfactory

14C . 4 ALTERNATOR BELT TENSION:

Adjust

Procedure

1. Check the belt tension at the centre of the longest span. Allow 0.393 inch (10 mm) deflection in MF2615 and 0.314 inch (8mm) in MF2605,when moderate finger pressure is applied to the longest run at the belt, see 'A' Fig. 4 & 5
2. If the belt tension is incorrect, slacken the mounting bolts.
3. Adjust the tension.
4. Re-tighten the bolts and recheck the belt tension.

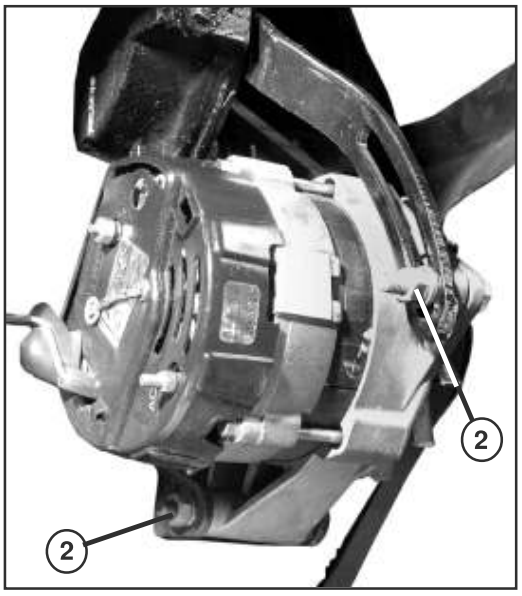

Fig 10

14C . 5 ALTERNATOR

Removal and refitment

Removal

1. 2600 series tractors: Pull the cable and lift the hood
2. Disconnect the battery, removing the negative cable (-) first in the interest of safety.
3. Remove the connections from the alternator terminals.
4. Slacken the pivot bolt.
5. Remove the clamp bolt.
6. Remove the guard, if fitted
7. Remove the fan belt from the alternator pulley.
8. While supporting the alternator, partially remove the pivot bolt.
9. Remove the alternator.
10. Remove the pulley guard and pivot bolt.

Refitment

11. Reverse procedures 1 to 10.
12. Adjust the belt tension, see operation 4 & 5.
13. If the pulley has been removed tighten the nut to a torque of 44 lbf.ft (60 Nm).

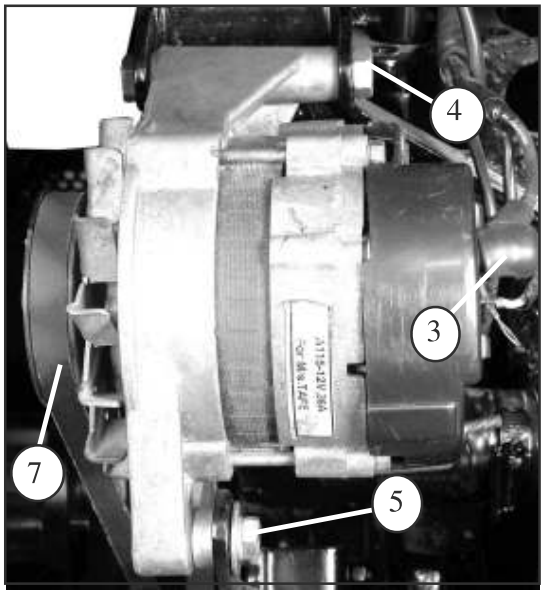

Fig 11